

Practitioner's Docket No. AP8706

CHAPTER II

TRANSMITTAL LETTER
TO THE UNITED STATES ELECTED OFFICE (EO/US)

(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP97/02756 ✓	28 May 1997 ✓	28 May 1996 ✓
TITLE OF INVENTION		
Pneumatic Brake Force Booster ✓		
APPLICANT(S)		
Jurgen Schonlau; Peter Bohm; Walter Peterknecht ✓		

Box PCT
Assistant Commissioner for Patents
Washington D.C. 20231

ATTENTION: EO/US

NOTE: The completion of those filing requirements that can be made at a time later than 30 months from the priority date results from the Commissioner exercising his judgment under the authority granted under 35 U.S.C. § 371(d). The filing receipt will show the actual date of receipt of the last item completing the entry into the national phase. See 37 C.F.R. § 1.491 which states: "An international application enters the national state when the applicant has filed the documents and fees required by 35 USC 371(c) within the periods set forth in § 1.494 and § 1.495."

CERTIFICATION UNDER 37 C.F.R. § 1.10*
(Express Mail label number is mandatory.)
(Express Mail certification is optional.)

I hereby certify that this Transmittal Letter and the papers indicated as being transmitted therewith is being deposited with the United States Postal Service on this date November 30, 1998 ✓, in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number EL134825279UIS ✓, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Joyce A. Krumpe

(type or print name of person mailing paper)

Joyce Krumpe

Signature of person mailing paper

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. § 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

***WARNING:** Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. § 1.10(b).
"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

WARNING: Where the items are those which can be submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. § 1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing - See 37 C.F.R. § 1.8.

NOTE: Documents and fees must be clearly identified as a submission to enter the national state under 35 U.S.C. § 371 otherwise the submission will be considered as being made under 35 U.S.C. § 111. 37 C.F.R. § 1.494(f).

I. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. § 371:

- a. ☒ This express request to immediately begin national examination procedures (35 U.S.C. § 371(f)).
- b. ☒ The U.S. National Fee (35 U.S.C. § 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

(Transmittal Letter to the United States Elected Office (EO/US) [13-18]—page 2 of 8)

2. Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
<input type="checkbox"/> *	TOTAL CLAIMS	5 - 20 =		× \$22.00 =	\$
	INDEPENDENT CLAIMS	1 - 3 =		× \$82.00 =	
	MULTIPLE DEPENDENT CLAIM(S) (if applicable) + \$270.00				
BASIC FEE**	<input type="checkbox"/> U.S. PTO WAS INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the U.S. PTO: <ul style="list-style-type: none"> <input type="checkbox"/> and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness) and industrial activity, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims presented in the application entering the national stage (37 CFR 1.492(a)(4)) \$98.00 <input type="checkbox"/> and the above requirements are not met (37 CFR 1.492(a)(1)) \$720.00 <input type="checkbox"/> U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where no international preliminary examination fee as set forth in § 1.482 has been paid to the U.S. PTO, and payment of an international search fee as set forth in § 1.445(a)(2) to the U.S. PTO: <ul style="list-style-type: none"> <input type="checkbox"/> has been paid (37 CFR 1.492(a)(2)) \$790.00 <input type="checkbox"/> has not been paid (37 CFR 1.492(a)(3)) \$1,070.00 <input checked="" type="checkbox"/> where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 CFR 1.492(a)(5)) \$930.00 				930.00
	Total of above Calculations =				930.00
SMALL ENTITY	Reduction by 1/2 for filing by small entity, if applicable. Affidavit must be filed also. (note 37 CFR 1.9, 1.27, 1.28)				—
	Subtotal				930.00
	Total National Fee				\$ 930.00
	Fee for recording the enclosed assignment document \$40.00 (37 CFR 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed				\$ 930.00

*See attached Preliminary Amendment Reducing the Number of Claims.

- i. ☐ A check in the amount of _____ to cover the above fees is enclosed.
- ii. ☒ Please charge Account No. 18-0013 in the amount of \$ 930.00.
A duplicate copy of this sheet is enclosed.

****WARNING:** "To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: * * * (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).

WARNING: If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.

3. ☒ A copy of the International application as filed (35 U.S.C. § 371(c)(2)):

NOTE: Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment. "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40; at 35-36. See item 14c below.

- a. ☒ is transmitted herewith.
- b. ☐ is not required, as the application was filed with the United States Receiving Office.
- c. ☐ has been transmitted
 - i. ☐ by the International Bureau.
Date of mailing of the application (from form PCT/1B/308): _____
 - ii. ☐ by applicant on _____
Date

4. ☒ A translation of the International application into the English language (35 U.S.C. § 371(c)(2)):

- a. ☒ is transmitted herewith.
- b. ☐ is not required as the application was filed in English.
- c. ☐ was previously transmitted by applicant on _____
Date
- d. ☐ will follow.

(Transmittal Letter to the United States Elected Office (EO/US) [13-18]—page 4 of 8)

5. ☐ Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. § 371(c)(3)):

NOTE: The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.

- a. ☐ are transmitted herewith.
- b. ☐ have been transmitted
 - i. ☐ by the International Bureau.
Date of mailing of the amendment (from form PCT/1B/308): _____
 - ii. ☐ by applicant on (date) _____
Date
- c. ☐ have not been transmitted as
 - i. ☐ applicant chose not to make amendments under PCT Article 19.
Date of mailing of Search Report (from form PCT/ISA/210.): _____
 - ii. ☐ the time limit for the submission of amendments has not yet expired.
The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.

6. ☐ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. § 371(c)(3)):
- a. ☐ is transmitted herewith.
 - b. ☐ is not required as the amendments were made in the English language.
 - c. ☐ has not been transmitted for reasons indicated at point 5(c) above.
7. ☐ A copy of the international examination report (PCT/IPEA/409)
- ☐ is transmitted herewith.
 - ☐ is not required as the application was filed with the United States Receiving Office.
8. ☐ Annex(es) to the international preliminary examination report
- a. ☐ is/are transmitted herewith.
 - b. ☐ is/are not required as the application was filed with the United States Receiving Office.
9. ☐ A translation of the annexes to the international preliminary examination report
- a. ☐ is transmitted herewith.
 - b. ☐ is not required as the annexes are in the English language.

10. ☒ An oath or declaration of the inventor (35 U.S.C. § 371(c)(4)) complying with 35 U.S.C. § 115

a. ☐ was previously submitted by applicant on _____
Date

b. ☐ is submitted herewith, and such oath or declaration

i. ☐ is attached to the application.

ii. ☐ identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. § 1.70.

iii. ☒ will follow.

II. Other document(s) or information included:

11. ☒ An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):

a. ☒ is transmitted herewith.

b. ☐ has been transmitted by the International Bureau.
Date of mailing (from form PCT/IB/308): _____

c. ☐ is not required, as the application was searched by the United States International Searching Authority.

d. ☐ will be transmitted promptly upon request.

e. ☐ has been submitted by applicant on _____
Date

12. ☒ An Information Disclosure Statement under 37 C.F.R. §§ 1.97 and 1.98:

a. ☒ is transmitted herewith.

Also transmitted herewith is/are:

☒ Form PTO-1449 (PTO/SB/08A and 08B).

☒ Copies of citations listed.

b. ☐ will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. § 371(c).

c. ☐ was previously submitted by applicant on _____
Date

13. ☐ An assignment document is transmitted herewith for recording.

A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

(Transmittal Letter to the United States Elected Office (EO/US) [13-18]—page 6 of 8)

14. ☒ Additional documents:

- a. ☐ Copy of request (PCT/RO/101)
- b. ☒ International Publication No. WO 97/45307
- i. ☐ Specification, claims and drawing
- ii. ☒ Front page only
- c. ☒ Preliminary amendment (37 C.F.R. § 1.121)
- d. ☐ Other

15. ☒ The above checked items are being transmitted

- a. ☒ before 30 months from any claimed priority date.
- b. ☐ after 30 months.

16. ☐ Certain requirements under 35 U.S.C. § 371 were previously submitted by the applicant on _____, namely:

AUTHORIZATION TO CHARGE ADDITIONAL FEES

WARNING: Accurately count claims, especially multiple dependant claims, to avoid unexpected high charges if extra claims are authorized.

NOTE: "A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

NOTE: "Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

- ☒ The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. 18-0013.

☒ 37 C.F.R. § 1.492(a)(1), (2), (3), and (4) (filing fees)

WARNING: Because failure to pay the national fee within 30 months without extension (37 CFR § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.

(Transmittal Letter to the United States Elected Office (EO/US) [13-18]—page 7 of 8)

☒ 37 C.F.R. § 1.492(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.

☒ 37 C.F.R. § 1.17 (application processing fees)

☒ 37 C.F.R. § 1.17(a)(1)–(5) (extension fees pursuant to § 1.136(a).

☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. § 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

☒ 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).


SIGNATURE OF PRACTITIONER

Joseph V. Coppola, Sr.

(type or print name of practitioner)

1533 N. Woodward Ave., Suite 140

P.O. Address

Bloomfield Hills MI 48304

Reg. No.: 33373

Tel. No.: (248) 594-0650

Customer No.:

(Transmittal Letter to the United States Elected Office (EO/US) [13-18]—page 8 of 8)

300 Rec'd PCT/PTO 30 NOV 1998

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Schonlau et al.

Serial No.: To be assigned

Group Art Unit:

Filed: Herewith

Examiner:

For: PNEUMATIC BRAKE FORCE BOOSTER

Attorney Docket No.: AP 8706

Assistant Commissioner of Patents
Washington, D.C. 20231**PRELIMINARY AMENDMENT**

Dear Sir:

Please amend the application as follows prior to examination on the merits:

IN THE CLAIMS:

Please cancel claims 1-6 and add the following new claims 7-11:

7. Pneumatic brake force booster for automotive vehicles which includes a booster housing whose interior is subdivided by a movable wall into a vacuum chamber and a working chamber, and a control housing accommodating a control valve which controls a pneumatic pressure differential that acts upon the movable wall, the said control valve having at least two sealing seats which cooperate with an elastic valve member, one of the sealing seats being operable by an actuating rod, on the one hand, and by an electromagnet independently of the actuating rod, on the other hand, wherein a cable duct is

hermetically sealed in the booster housing through which electric lines extend into the interior of the booster housing, and wherein the cable duct is configured as an injection molded plastic part, inside which the electric lines are partly insulated and tin-plated in their insulated portion.

8. Brake force booster as claimed in claim 7, wherein the electric lines are fitted to a retaining member which has a star-like configuration in cross-section, and the cable duct is provided by plastic lamination of the retaining member with the lines.
9. Brake force booster as claimed in claim 7, wherein the cable duct has a radial extension which bears against the booster housing and on which a retaining clip is provided to position the electric lines.
10. Brake force booster as claimed in claim 7, wherein the cable duct has an anti-torsion mechanism.
11. Brake force booster as claimed in claim 10, wherein the cable duct, on the side of the extension close to the booster housing, includes a projection which engages into a recess provided in the booster housing.

REMARKS

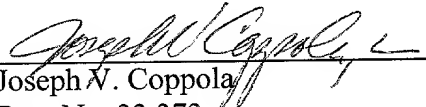
Prior to a formal examination of the above-identified application, acceptance of the new claims and the enclosed substitute specification is respectfully requested. The substitute specification and the new claims are submitted to conform this case to the formal requirements of U.S. Patent Office practice.

STATEMENT

The undersigned, an attorney registered to practice before the office, hereby states that the enclosed substitute specification contains no new subject matter.

Respectfully submitted,

By:


Joseph N. Coppola
Reg. No. 33,373
Rader Fishman & Grauer PLLC
Suite 140
1533 N. Woodward Avenue
Bloomfield Hills, Michigan
48304
(248) 594-0650

CERTIFICATE OF MAILING

I hereby certify that the enclosed Preliminary Amendment is being deposited with the United States Postal Service on the date shown below with sufficient postage as Express Mail Post Office to Addressee mailing Label Number EL134825279US in an envelope addressed to the: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Date: 11/30/98

By: Joyce Kaumpe

R0040892

300 Rec'd PCT/PTO 30 NOV 1998

Pneumatic Brake Force Booster

The present invention relates to a pneumatic brake force booster for automotive vehicles which includes a booster housing whose interior is subdivided by a movable wall into a first chamber (vacuum chamber) and a second chamber (working chamber), and a control housing accommodating a control valve which controls a pneumatic pressure differential that acts upon the movable wall, the said control valve having at least two sealing seats which cooperate with an elastic valve member, one of the sealing seats being operable by an actuating rod, on the one hand, and by an electromagnet independently of the actuating rod, on the other hand, wherein a cable duct is hermetically sealed in the booster housing through which electric lines extend into the interior of the booster housing.

A brake force booster of this type is, for example, known from international patent application WO 95/32879. In the prior art brake force booster, the cable duct comprises two hermetically sealed parts. The first, preferably tubular part which projects into the interior of the booster housing is configured as a measuring element of a travel sensor which is used to sense the movement of the movable wall of the brake force booster. The second part which is especially used to position and seal the electric lines is shifted into a large-diameter accommodation provided at the end of the first part. The first part is accommodated in the wall of the booster housing so as to be hermetically sealed by a sealing sleeve, and the sealing sleeve is attached to an opening in the booster housing.

The prior art brake force booster suffers from the special

disadvantage of the two-part design of the cable duct which necessitates high costs in manufacture. Further shortcomings are the expenditure in time needed in the manufacture and the relatively reduced safety of the manufacturing process.

Therefore, an object of the present invention is to suggest provisions which permit a major reduction in costs related to the manufacture of the cable ducts. An additional objective is to ensure a simple assembly and a great reliability in operation of the overall assembly.

According to the present invention, this object is achieved in that the cable duct is configured as an injection molded plastic part wherein inside the electric lines are partly insulated.

A preferred aspect of the object of the present invention includes that the electric lines are tin-plated in their insulated portion. Aspiration of air through the spaces between the strands into the vacuum chamber is prevented by this measure.

To reliably prevent contact of the insulated portion in the manufacture of the cable duct of the present invention, according to another preferred aspect of the object of the present invention, the electric lines are fitted to a retaining member which has a star-like configuration in cross-section, and the cable duct is provided by plastic lamination of the retaining member with the lines.

To achieve an accurately defined guiding of the electric lines in the inside of the brake force booster housing, the cable duct has a radial extension which bears against the booster housing and on which a retaining clip is provided to position the electric lines.

The present invention will be explained in detail in the following description by way of an embodiment making reference to the accompanying drawing.

In the drawing,

Figure 1 is a partial longitudinal cross-sectional view of the brake force booster of the present invention.

Figure 2 is a partial axial sectional view of the cable duct provided in the brake force booster of Figure 1.

A booster housing 1 (only represented in Figure 1) of the illustrated vacuum brake force booster of the present invention is subdivided by an axially movable wall 2 into a working chamber 3 and a vacuum chamber 4. The axially movable wall 2 includes a circular, force-transmitting deepdrawn sheet-metal diaphragm plate 5 and a flexible diaphragm 6 which abuts thereon and is made of a rubber-like material. Diaphragm 6, in the capacity of a rolling diaphragm, provides a sealing between the outside periphery of the diaphragm plate 5 and the booster housing 1. In the middle of the diaphragm plate 5 and the diaphragm 6, the two parts are connected to a control housing (not shown) which accommodates a control valve (not shown either).

A cable duct, designated by reference numeral 7, is unrotatably accommodated in an opening 8 in the booster housing half shown on the the left side in the drawing, and is retained by a bayonet ring 10. Radially inwardly directed projections 11 of ring 10 cooperate, or form a bayonet-type connection, with grooves 12 provided in the cable duct 7. A ring seal 13 reliably seals the cable duct 7 in relation to the booster housing 1. Ring seal 13 is axially press fitted between the surface of

booster housing 1 and the end surface of bayonet ring 10 facing the booster housing 1 during assembly of the cable duct 7 of the present invention. A second ring seal 14 which is arranged in a radial groove 15 in the cable duct 7 is used to seal the cable duct 7 in relation to the bayonet ring 10.

As can be seen from Figure 2 in particular, the above-mentioned cable duct 7 has a substantially cylindrical shape and includes a portion 16 which extends from the inside through the booster housing 1 in the area of the opening 8. Portion 16 passes over into a radial extension 17 of larger diameter which, in the assembled condition of the cable duct, abuts inside the vacuum chamber 4 on the booster housing 1. The anti-torsion mechanism in opening 8 is provided by a projection (not shown) which axially protrudes from the extension 17 and is received in a recess provided at the edge of opening 8. Further, a retaining clip 24 is shaped on the frontal end of extension 17. Clip 24 is used to position the cable portion 25 that extends into the interior of the booster housing 1.

It can be seen from the mid-portion (preferably shown in a partial view) of the cable duct 7 illustrated in Figure 2 that a plurality of lines 18, 19, integrated in an electric cable loom 20, extend without interruption through the cable duct 7 and are stripped in their portion 21, 22 disposed in duct 7. It is especially appropriate that the lines 18, 19 are tin-plated in the stripped portion 21, 22, so that aspiration of air through the spaces between the strands is rendered impossible.

In making the cable duct 7 of the present invention, a plurality of lines (for example, five lines) are fitted to a retaining member 23 (shown in dotted lines in the drawing) which has a preferably star-like configuration in cross-section. Subsequently, plastic material is spray-coated onto the so

prepared arrangement in a suitable extrusion die. The above-mentioned star-like profile prevents compression of the stripped points as a result of the die-casting pressure.

During the assembly of the cable duct 7 of the present invention, initially, its portion 16 which extends outwardly from the booster housing 1 is slipped from the inside through the opening 8 and is positioned so that the projection (not shown), used as an anti-torsion mechanism, engages the recess in the booster housing 1, and the cable duct 7 with its radial extension 17 will move into abutment on the booster housing 1. Thereafter, the above-mentioned ring seal 12 is fitted around the cable duct 7, whereupon the bayonet ring 10 is so slipped on that the initially described projections 11 are inserted into the grooves 12 in the cable duct 7. Because one (27) of the groove flanks 26, 27 passes into an inclination 28, clockwise rotation of the bayonet ring 10, in the course of which the projections 11 are moved along the inclinations 28, cause tightening of the bayonet connection and a simultaneous press fit of the ring seal 13. The result is a proper sealing of the cable duct of the present invention in relation to the booster housing 1. At the end of the described rotation, the projections 11 abut on a stop 30 which is provided by a radial rib 29, respectively, which bounds the grooves 12.

List of Reference Numerals:

- 1 booster housing
- 2 movable wall
- 3 working chamber
- 4 vacuum chamber
- 5 diaphragm plate
- 6 rolling diaphragm
- 7 cable duct
- 8 opening
- 10 bayonet ring
- 11 projection
- 12 groove
- 13 ring seal
- 14 ring seal
- 15 annular groove
- 16 portion
- 17 extension
- 18 line
- 19 line
- 20 cable
- 21 portion
- 22 portion
- 23 retaining member
- 24 retaining clip
- 25 cable portion
- 26 groove flank
- 27 groove flank
- 28 inclination
- 29 rib
- 30 stop

Patent Claims:

1. Pneumatic brake force booster for automotive vehicles which includes a booster housing whose interior is subdivided by a movable wall into a first chamber (vacuum chamber) and a second chamber (working chamber), and a control housing accommodating a control valve which controls a pneumatic pressure differential that acts upon the movable wall, the said control valve having at least two sealing seats which cooperate with an elastic valve member, one of the sealing seats being operable by an actuating rod, on the one hand, and by an electromagnet independently of the actuating rod, on the other hand, wherein a cable duct is hermetically sealed in the booster housing through which electric lines extend into the interior of the booster housing,
c h a r a c t e r i z e d in that the cable duct (7) is configured as an injection molded plastic part inside which the electric lines (18, 19) are partly insulated.
2. Brake force booster as claimed in claim 1,
c h a r a c t e r i z e d in that the electric lines (18, 19) are tin-plated in their insulated portion (21, 22).
3. Brake force booster as claimed in claim 1 or claim 2,
c h a r a c t e r i z e d in that the electric lines (18, 19) are fitted to a retaining member (23) which has a star-like configuration in cross-section, and the cable duct (7) is provided by plastic lamination of the retaining member (23) with the lines (18, 19).

4. Brake force booster as claimed in any one of the preceding claims,
c h a r a c t e r i z e d in that the cable duct (7) has a radial extension (17) which bears against the booster housing (1) and on which a retaining clip (24) is provided to position the electric lines (18, 19 or 25, respectively).
5. Brake force booster as claimed in any one of the preceding claims,
c h a r a c t e r i z e d in that the cable duct (7) has an anti-torsion mechanism.
6. Brake force booster as claimed in claim 5,
c h a r a c t e r i z e d in that the cable duct (7), on the side of the extension (17) close to the booster housing (1), includes a projection which engages into a recess provided in the booster housing (1).

Abstract:

Brake Force Booster for Automotive Vehicles

The present invention discloses a brake force booster for automotive vehicles having a control valve which is operable by an electromagnet independently of an actuating rod that displaces a valve piston. The electromagnet and further electric means are supplied with current by way of electric lines which extend through a cable duct that is hermetically sealed in the booster housing.

To achieve a major reduction in costs incurred during manufacture of the cable duct (7), according to the present invention, the cable duct (7) is an injection molded plastic part inside which the electric lines (18, 19) are partly stripped.

(Figure 2)

Fig. 1

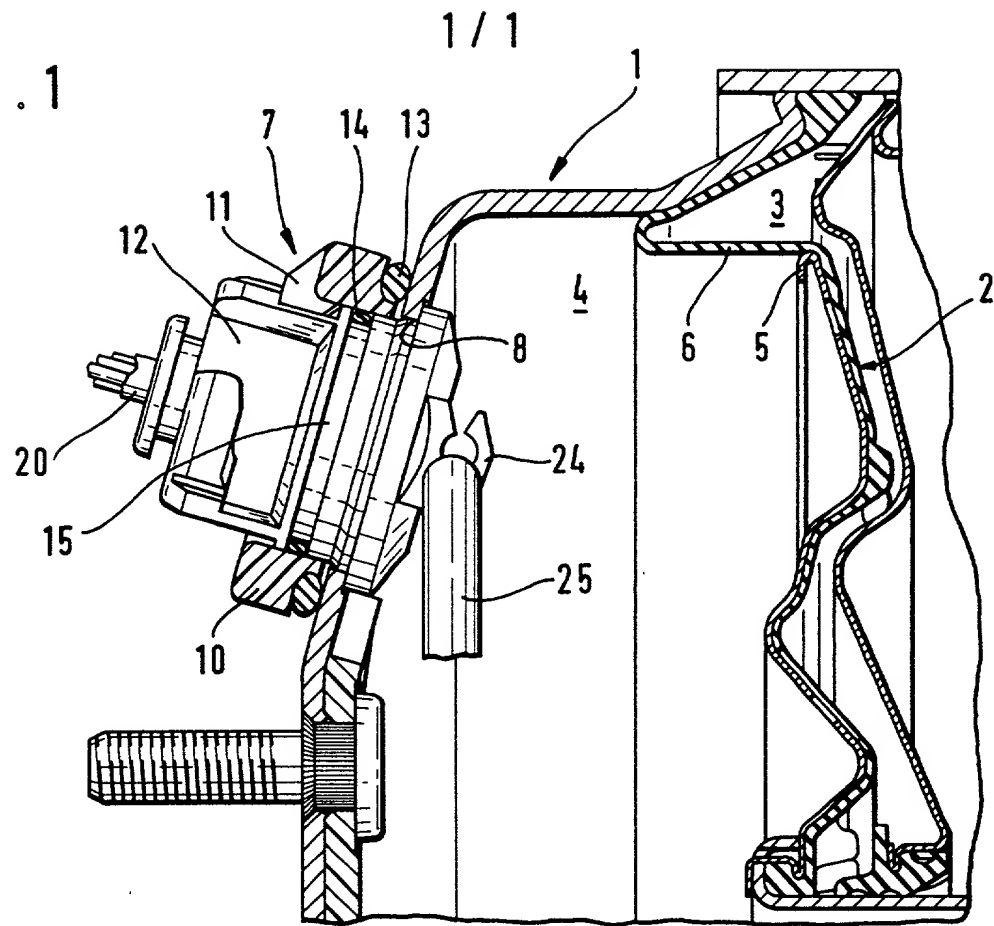
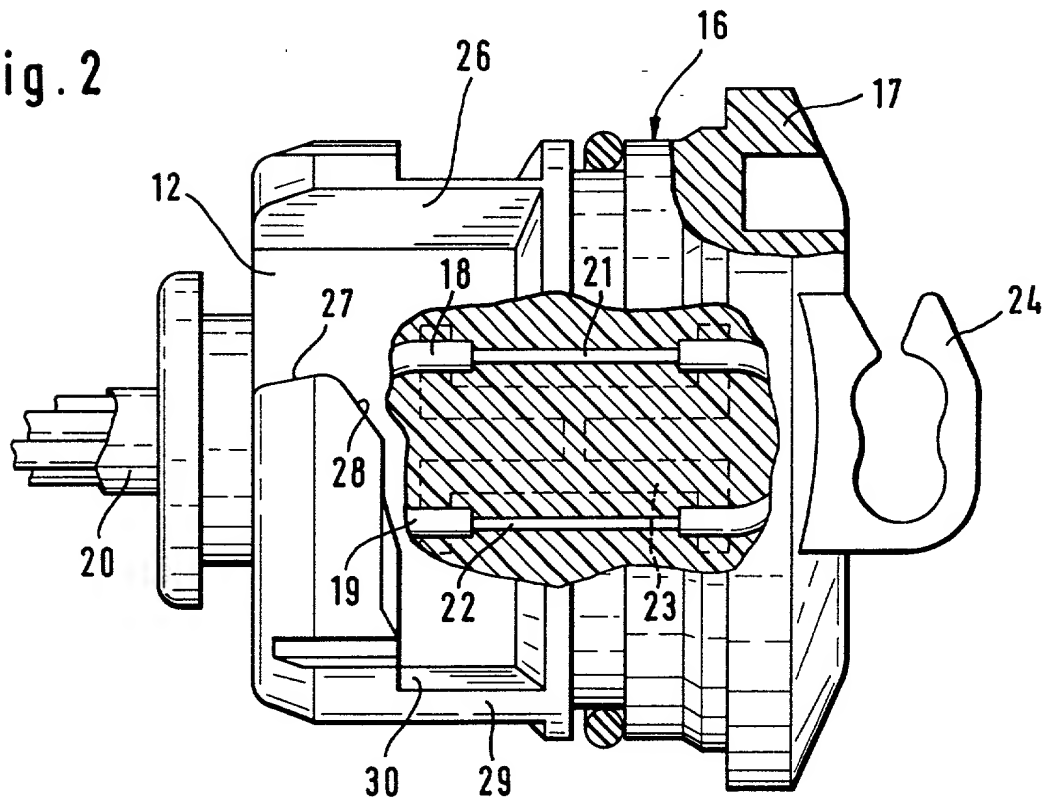


Fig. 2



AP 8706

Declaration and Power of Attorney for Patent Application

Erklärung für Patentanmeldungen mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

daß mein Wohnsitz, meine Postanschrift und meine Staatsangehörigkeit den im nachstehenden nach meinem Namen aufgeführten Angaben entsprechen, daß ich nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent für die Erfindung mit folgendem Titel beantragt wird:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

PNEUMATIC BRAKE FORCE BOOSTER

PNEUMATIC BRAKE FORCE BOOSTER

deren Beschreibung hier beigelegt ist, es sei denn (in diesem Falle Zutreffendes bitte ankreuzen), diese Erfindung

the specification of which is attached hereto unless the following box is checked:

☒ wurde angemeldet am 28 May 1997 unter der US-Anmeldenummer oder unter der Internationalen Anmeldenummer im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT) PCT/EP97/02756.

☒ was filed on 28 May 1997 as United States Application Number or PCT International Application Number PCT/EP97/02756.

Ich bestätige hiermit, daß ich den Inhalt der oben angegebenen Patentanmeldung, einschließlich der Ansprüche, die durch einen oben erwähnten Zusatzantrag und in einem "preliminary amendment" abgeändert wurden, durchgesehen und verstanden habe.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above and as amended in a preliminary amendment.

Ich erkenne meine Pflicht zur Offenbarung jeglicher Informationen an, die eventuell zur Prüfung der Patentfähigkeit in Einklang mit Titel 37, Code of Federal Regulations, § 1.56 von Belang sind.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

[Page 1 of 3]

Burden Hour Statement: This form is estimated to take 0.4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner of Patents and Trademarks, Washington, DC 20231.

German Language Declaration

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Title 35, US-Code, § 119 (a)-(d), bzw. § 365(b) aller unten aufgeführten Auslandsanmeldungen für Patente oder Erfinderurkunden, oder §365(a) aller PCT internationalen Anmeldungen, welche wenigstens ein Land ausser den Vereinigten Staaten von Amerika benennen, und habe nachstehend durch ankreuzen sämtliche Auslandsanmeldungen für Patente bzw. Erfinderurkunden oder PCT internationale Anmeldungen angegeben, deren Anmeldetag dem der Anmeldung, für welche Priorität beansprucht wird, vorangeht.

I hereby claim foreign priority under Title 35, United States Code, §119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications
(Frühere ausländische Anmeldungen)

Priority Not Claimed
Priorität nicht beansprucht

196 21 321.5 Germany

28 May 1996

☐

Number Country

Day/Month/Year Filed

☐

Ich beanspruche hiermit Prioritätsvorteile unter Title 35, US-Code, § 119(e) aller US-Hilfsanmeldungen wie unten aufgezählt.

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

Application No., filed on Filing Date

Application No., filed on Filing Date

Ich beanspruche hiermit die mir unter Title 35, US-Code, § 120 zustehenden Vorteile aller unten aufgeführten US-Patentanmeldungen bzw. § 365(c) aller PCT internationalen Anmeldungen, welche die Vereinigten Staaten von Amerika benennen, und erkenne, insofern der Gegenstand eines jeden früheren Anspruchs dieser Patentanmeldung nicht in einer US-Patentanmeldung, bzw. PCT internationalen Anmeldung in in einer gemäß dem ersten Absatz von Title 35, US-Code, § 112 vorgeschriebenen Art und Weise offenbart wurde, meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentfähigkeit in Einklang mit Title 37, Code of Federal Regulations, § 1.56 von Belang sind und die im Zeitraum zwischen dem Anmeldetag der früheren Patentanmeldung und dem nationalen oder im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT) gültigen internationalen Anmeldetags bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

Application No., filed on Filing Date

Status: patented/pending/abandoned

Application No., filed on Filing Date

Status: patented/pending/abandoned

Ich erkläre hiermit, daß alle in der vorliegenden Erklärung von mir gemachten Angaben nach bestem Wissen und Gewissen der Wahrheit entsprechen, und ferner daß ich diese eidesstattliche Erklärung in Kenntnis dessen ablege, daß wissentlich und vorsätzlich falsche Angaben oder dergleichen gemäß § 1001, Title 18 des US-Code strafbar sind und mit Geldstrafe und/oder Gefängnis bestraft werden können und daß derartige wissentlich und vorsätzlich falsche Angaben die Rechtswirksamkeit der vorliegenden Patentanmeldung oder eines aufgrund deren erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den (die) nachstehend aufgeführten Patentanwalt (Patentanwälte) und/oder Vertreter mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Angelegenheiten vor dem US-Patent- und Markenamt:

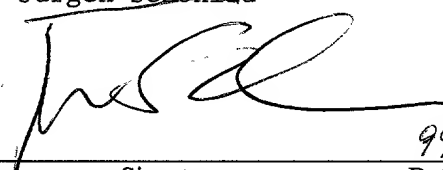


Joseph V. Coppola ~~33,373~~
Kevin Rutherford ~~40,412~~
Michael B. Stewart ~~36,018~~

Korrespondenzadresse:
Joseph V. Coppola, Sr.
Rader, Fishman & Grauer PLLC
Suite 140
1533 N. Woodward Avenue
Bloomfield Hills MI 48304
Telefon: (248) 594-0650

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

Joseph V. Coppola 33,373
Kevin Rutherford 40,412
Michael B. Stewart 36,018

Correspondence Address:
Joseph V. Coppola, Sr.
Rader, Fishman & Grauer PLLC
Suite 140
1533 N. Woodward Avenue
Bloomfield Hills MI 48304
Phone No.: (248) 594-0650

<p>1-00 Jurgen Schonlau  99-02-08 Signature Date Muhlstrasse 62b D-65396 Walluf DEX Germany Citizen of Germany</p>	<p>2-00 Peter Bohm  99-02-08 Signature Date Saalburgstrasse 64 D-61381 Friedrichsdorf DEX Germany Citizen of Germany</p>
<p>3-00 Walter Peterknecht  28.01.99 Signature Date Lahnstrasse 13 D-60488 Frankfurt DEX Germany Citizen of Germany</p>	<p>Full name of fourth joint inventor, if any Signature Date Street Address City State/Country Citizen of</p>



If box is checked, subsequent inventors are listed on a separate sheet